No. 698,540. Patented Apr. 29, 1902.

# G. M. McCLAIN.

## AUTOMATIC SELF CLOSING FIRE DOOR.

(Application filed Apr. 5, 1901.)

(No Model.)

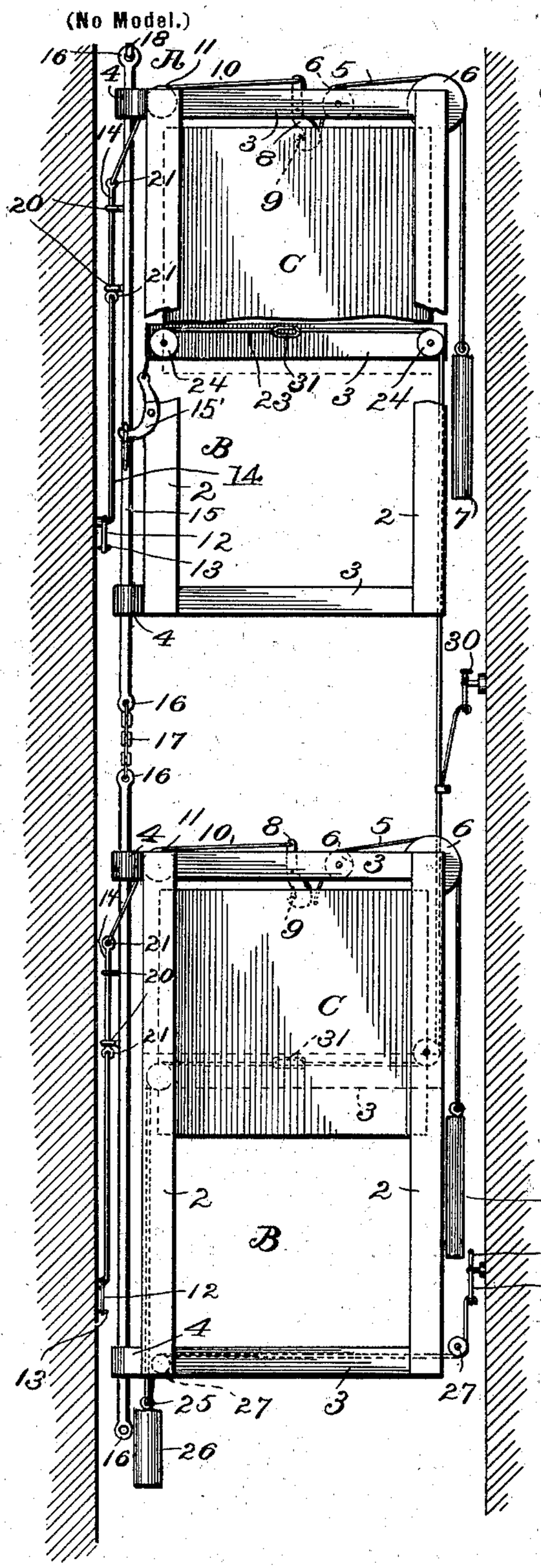


Fig. 1.

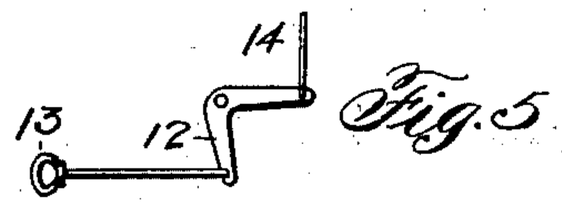


Fig. 5.

Fig. 2.

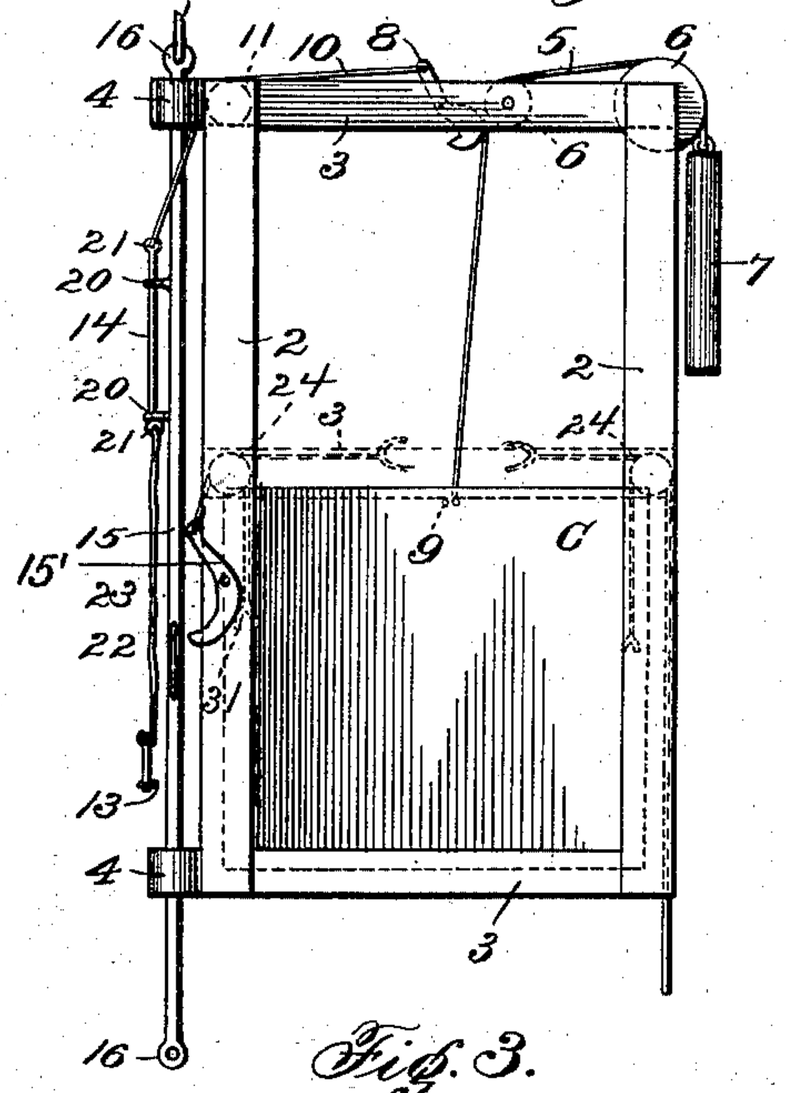


Fig. 3.

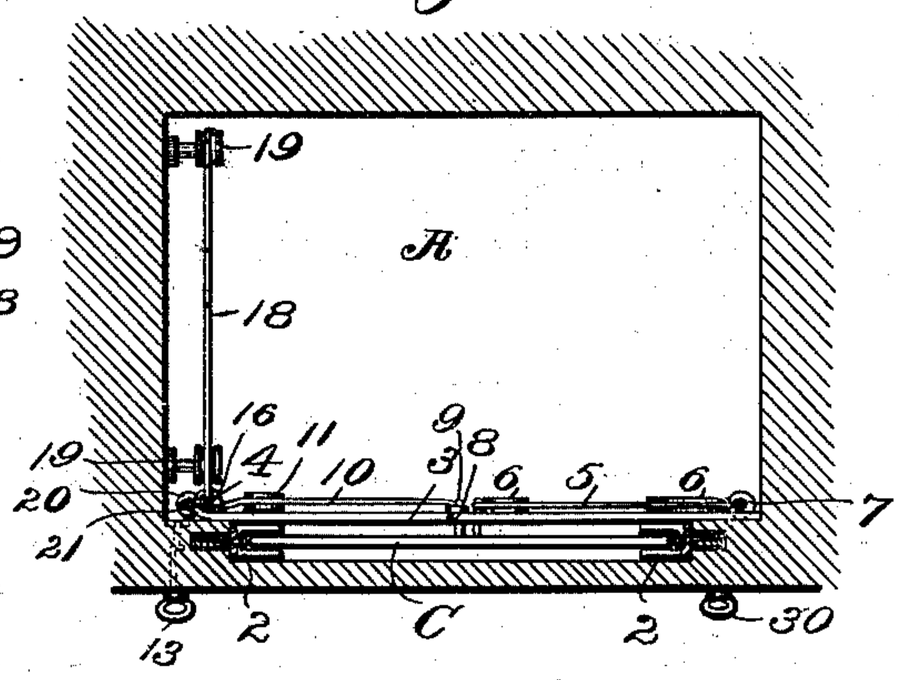


Fig. 4.

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# UNITED STATES PATENT OFFICE.

GEORGE MORTON McCLAIN, OF NEW YORK, N. Y.

## AUTOMATIC SELF-CLOSING FIRE-DOOR.

SPECIFICATION forming part of Letters Patent No. 698,540, dated April 29, 1902.

Application filed April 5, 1901. Serial No. 54,516. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE MORTON McCLAIN, a citizen of the United States of America, residing at 58 Hamilton Place, in the borough of Manhattan, city, county, and State of New York, have invented a new and useful Improvement in Automatic Self-Closing Fire Doors or Sashes, of which the following is a specification.

This invention relates to automatic self-closing fire doors or sashes, and has for its object to provide means whereby such doors or sashes may be automatically closed by heat generated by a fire in the neighborhood of such doors or sashes, and thereby prevent such fire from spreading through the openings.

A further object of the invention is to provide means on each floor of the building by which the entire series of doors or sashes may be simultaneously closed by hand.

A further object of the invention is to provide means near each door or sash by which such doors or sashes may be separately closed when desired.

This invention comprises generally a series of catches adapted to hold the doors or sashes normally open and connected with means for manually releasing each catch and with separate distinct means for releasing all of said catches simultaneously, the said latter means being provided with heat-operated parts and also with manually-operated parts.

One form of my invention is shown in the accompanying drawings, in which—

Figure 1 is a front elevation of a series of openings, such as those in a dumb-waiter shaft of a building, the front being broken away. Fig. 2 is a similar view of one of said openings with the door or sash closed by the destruction by heat of the fusible device. Fig. 3 is a transverse sectional view through the shaft above the highest of said openings. Fig. 4 is a detail view of an expansion-bolt, and Fig. 5 is a detail view showing a bell-crank lever.

In the form of invention which is shown in the drawings, A represents generally the shaft, B the space generally occupied by the openings for the shaft-doors, and C the fire door or sash, which is shown as a single sliding door. Suitable channel-irons 2, shown as rectangular in cross-section, are secured, as by expansion-bolts, to the inside walls of the shaft A alongside the openings B. Extending across and secured to said channel-irons 2 are three cross-pieces 3, one at the bottom, one at the top of said irons, and one at the head of the openings B, those at the top and bottom having their ends turned back on themselves to form eyes 4. The doors C slide in these channel-irons 2 and are sufficiently large to overlap the opening B on all sides when closed, so as to prevent the escape through said opening B of the flames. Attached to the doors C are wires 5 or other suitable fireproof connections, which pass over pulleys 6, secured on the cross-piece 3, and have weights 7 on their other end slightly lighter than the doors C. At suitable points on the cross-pieces 3 are pivoted gravity-latches 8, which normally engage studs 9 on the doors C. Wires 10 or other suitable fireproof connections are secured at one end of the latches 8 and are carried by suitable means, shown as pulleys 11, attached to said cross-pieces 3, to convenient points, where their other ends are secured to the upper arms of bell-crank levers 12, secured on the inside walls of the shaft A, the other arms of the bell-crank levers 12 being connected to hand-pulls 13, mounted conveniently near the opening B on the outside. The wires 10 may have inserted rods 14, provided with eyes 21 at the ends. Rods 15, provided at each end with an eye 16, pass through the eyes 4, alongside each opening B, and said rods 15 are flexibly connected together, as by chains 17 or other fireproof means. The rods 15 have eyes 20, through which the separate releasing connections of each latch 8, here shown as rods 14, pass, said eyes 20 engaging projections on such connections, as the eyes 21 at the lower ends of the rods 14, so that the fall of the rods 15 disengages the latches 8. The rods are supported by a catch 15′, connected to the topmost rod, as at 22, and secured to one end of a continuous wire 23, which is carried by suitable means, shown as pulleys 24, mounted on the cross-pieces 3 at the heads of the openings B, across the head of each opening B, and is protected by such cross-pieces 3, and below the lowest of the openings B passes through and is secured to the eye 25 of a weight 26, and is then carried by suitable means, shown as pulleys

27, mounted on the cross-piece 3 at the bottom of the lowest of the openings B, to a convenient point, where it is secured to an arm of a bell-crank lever 28, mounted on the wall of the shaft A. The other arm of the bell-crank lever 28 is connected to a hand-pull 29, suitably placed on the outside near the opening B. On each floor, conveniently located near the opening B, is a hand-pull 30, connected to one arm of a bell-crank lever mounted in the shaft A and having its other arm connected to the wire 23. The wire 23 has in its horizontal portions crossing the openings B one or more fusible links 31.

It is evident that the invention may be applied equally well to doors or sashes in which the lowering of the upper half raises the lower to meet it, or the two halves swing laterally or longitudinally, and it is not therefore confined to any mode of closing the door or sash except that it be self-closing.

The operation of the invention is as follows: When it is desired to separately close any one of the openings B, the corresponding hand-pull 13 is operated, which through the bell-crank lever 12, wire 10, rod 14, pulley 11, and latch 8 releases the door C, which closes by its own weight. In case it is desired to close all the doors simultaneously the hand-pull 29 on the lower floor or one of the hand-pulls 30 on one of the other floors is operated, and thereby weight 26 is raised, the rods 15 are permitted to fall, and the eyes 20 on such rods 15, engaging the eyes 21 at the lower ends of the rods 14, release the latches 8 in the same manner as if the hand-pull 13 was used, and the doors C throughout the series are closed; but in case of an emergency, as a fire, as soon as the heat in any one of the openings becomes sufficient to fuse the link 31 the rods 15 are lowered, and, as explained above, release the latches 8 and the whole series of doors C are closed. For returning the rods 15 to their normal position after they have fallen and released the catches some suitable means may be employed, such as a wire 18, secured in the upper eye of the topmost rod 15, which wire is carried by suitable means, here shown as pulleys 19, mounted on the wall of the shaft A, to any convenient point for manual operation.

I claim—

1. In combination with a door adapted when released to close automatically; a latch adapted to secure the door and normally hold it open; a hand-pull; a connection between the latch and the hand-pull for releasing the door; a projection upon this connection; and a sliding heat-operated member having a projection coöperating with the projection on the connection and adapted to engage and operate said releasing connection.

2. In combination with an opening into a shaft and a self-closing door therein; a gravity-latch for normally holding the door open; a pulley mounted convenient to said opening; a fireproof cord secured to said latch and extending over said pulley; a projection on said cord; a bell-crank lever having one arm secured to the other end of said cord and mounted in said shaft; a hand-pull secured to the other arm of said bell-crank lever and conveniently located outside said shaft; and heat-operated means having an eye traversed by said cord and adapted to engage the projection thereon to operate the latch.

3. A series of self-closing doors; gravity-latches for normally holding said doors open; fireproof hand-operated means for releasing each latch separately; and heat-operated means for operating said latches through their respective hand releasing means.

4. A series of doors; gravity-latches for normally holding said doors open; hand-operated means for releasing each latch separately; and compound hand and heat operated means for operating all the latches simultaneously through the individual hand releasing means.

5. The combination with a series of doors, one above the other and adapted when released to close automatically, releasing means for each door; hand-operated means for operating said means; and heat-operated means for operating all of the doors simultaneously through the hand-operated releasing means.

6. A series of self-closing doors; gravity-latches for normally holding said doors open; pulleys mounted at points convenient to the openings for said doors; a fireproof cord attached to each of said latches and extending over one of said pulleys and to a suitable point; a bell-crank lever suitably mounted near said point and having one arm attached to said cord; a hand-pull secured to the other arm of said bell-crank lever and located within the building; and heat-operated means operative upon said cords.

7. A series of self-closing doors; automatic gravity-latches for normally holding said doors open; pulleys mounted near said openings; a fireproof cord attached to each of said latches and extending over one of said pulleys; a hand-pull secured to the free end of each of said cords, a sliding member extending alongside said openings from the upper to the lower of said openings, said member provided with eyes adapted when said member is lowered to engage protuberances on said cords; and a wire having a weight at one end and extending horizontally across said openings and having its upper end connected to said sliding member and adapted normally to hold said sliding member in its highest position, said wire having fusible links in its horizontal portions.

8. A series of self-closing doors; automatic gravity-latches for normally holding said doors open; pulleys mounted near said openings; a fireproof cord attached to each of said latches and extending over one of said pulleys; a hand-pull secured to each cord; a fireproof cord secured to each door and extending over another of said pulleys and hav-

ing its end secured to a counterweight; a sliding member extending alongside said openings from the upper to the lower end thereof, said member provided with eyes adapted when said member is lowered to engage the hand-pull cords; and a wire having a weight at one end and extending horizontally across said openings and having its upper end connected to said sliding member and adapted to hold said sliding member in its highest position, said wire having fusible links in its horizontal portions.

9. The combination with a shaft, of ways alongside the openings into said shaft; doors sliding in said ways and effective to close by their own gravity; means for normally holding each of said doors open; hand-operated means for separately releasing each of said holding means; and heat-operated means for simultaneously operating all of said releasing means.

10. The combination with a shaft, of ways alongside the openings in said shaft; doors sliding in said ways; means for normally holding said doors open; hand-operated means for releasing each of said holding means; heat-operated means for simultaneously actuating all said hand releasing means; and hand-operated means for actuating said general releasing means.

11. The combination with a shaft, of fireproof ways alongside said openings into said shaft; fireproof doors sliding in said ways and adapted when closed to overlap the sides of said openings; fireproof means for normally holding said doors open; hand-operated fireproof means for separately releasing each of said holding means; heat-operated means for operating all of said holding means at once through said hand-operated releasing means; and hand-operated means operative upon said heat-operated means.

12. The combination with a shaft, of fireproof ways alongside the openings into said shaft; fireproof doors sliding in said ways; fireproof means for normally holding said doors open; separate hand-operated means for releasing each of said holding means; and fusible means for operating all of said holding means at once through said releasing means.

13. The combination with a shaft having openings; of fireproof ways alongside the openings into said shaft; fireproof doors sliding in said ways and adapted when closed to overlap the sides of said openings; fireproof latch-supporting means near said doors; fireproof gravity-latches, pivoted to said supporting means above said doors, for normally holding said doors open; a hand-pull inside the building for releasing each of said latches; fireproof connections between each of said latches and its respective hand-pull; and infusible connections for operating all of the latches through the hand-pull connections thereto simultaneously in case of fire.

14. The combination, with a light, air or hoist shaft having openings thereinto, of fireproof ways located inside the shaft alongside the openings; fireproof doors sliding in the ways and adapted to overlap the openings on all sides when closed; cross-pieces connecting the top and bottom of the ways on opposite sides of the openings and having one of their ends turned back on itself; counterweights connected with the doors; latches for normally holding the doors open; hand-pulls connected with the latches; a member alongside each opening sliding in the eyes formed in the ends of the cross-pieces, said member connected with the hand-pull and adapted to operate the same when lowered all of said members being connected together; and heat-operated means for lowering said sliding members.

15. In combination with a sliding door adapted when released to shift automatically; means adapted to secure said door in its normal position; manually-operative means for releasing said securing means to permit the door to shift; and means embodying a plurality of heat-actuated devices for operating said releasing means through the actuation of any one of said devices.

16. The combination with a series of doors adapted when released to close automatically; releasing means for each door; hand-operated means for operating said means; and heat-operated means for operating all of the doors simultaneously through the hand-operated releasing means.

In testimony whereof I, GEORGE MORTON MCCLAIN, have signed my name to this specification, in the presence of two subscribing witnesses, this 3d day of April, 1901.

GEORGE MORTON McCLAIN.

Witnesses:
JOHN KURSTEINER,
E. EDNA SCHAFFNER.